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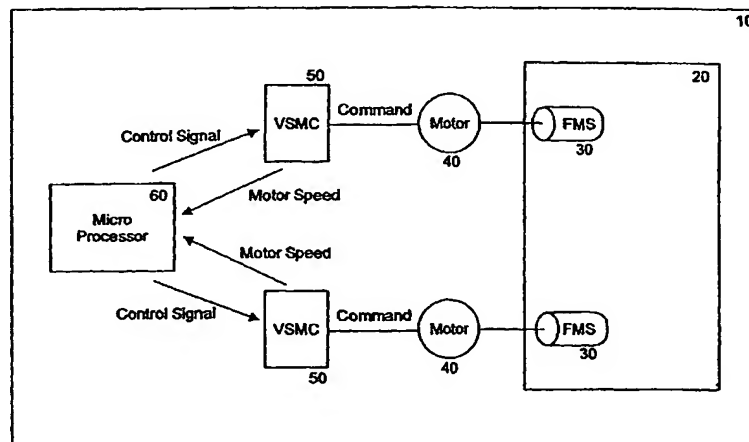
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(54) Title: **FLUID FLOW BALANCING SYSTEM**



(57) Abstract: The present invention provides an apparatus for controlling a system (10) which includes a fluid conduit network (20) and at least two motors (40) each drivingly engaged with different fluid movement devices (30), the apparatus comprising means for providing a speed signal representative of the speed of each motor and means (50) for providing a control signal in response to the speed of each motor. The apparatus also comprises a means (60) for controlling the speed of each motor in response to the control signal wherein each motor speed is controlled for balancing the rate of fluid movement at an input point and an exit point of the system. A method for controlling a system is also provided under the present invention which includes a fluid conduit network and at least two motors each drivingly engaged with different fluid movement devices, the method comprising the steps of a) sensing the speed signal representative of the speed of each motor in the system, b) generating, by the use of a microprocessor, control signals representing new desired speeds for each motor and c) transmitting a command to each motor in response to the control signals, the command adjusting the motor speeds thereby balancing the rate of fluid movement at an input point and an exit point of the system.

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G05D7/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G05D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 95 09305 A (DIVERSEY CORP) 6 April 1995 (1995-04-06)	1-4,8,9
Y	the whole document	5-7
Y	---	
Y	US 4 910 682 A (WOLFF DONALD L ET AL) 20 March 1990 (1990-03-20)	5-7
A	column 11, line 59 -column 13, line 15; figure 2	1-4,8,9
A	---	
A	US 4 108 575 A (SCHAL WILFRIED) 22 August 1978 (1978-08-22)	1,5-7
A	column 3	
A	---	
A	US 4 705 457 A (BELUSA MANFRED L) 10 November 1987 (1987-11-10)	1-9
	the whole document	

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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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- *&* document member of the same patent family

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>US 5 269 660 A (PRADELLE BERNARD PIERRE) 14 December 1993 (1993-12-14) the whole document -----</p>	1-9

INTERNATIONAL SEARCH REPORT

Information on patent family members

Internal Application No
PCT 03/00818

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9509305	A	06-04-1995	AT 166702 T AU 698430 B2 AU 7735694 A BR 9407705 A CA 2171716 A1 WO 9509305 A1 DE 69410623 D1 DE 69410623 T2 EP 0720693 A1 ES 2117801 T3 JP 9505863 T PL 313700 A1 US 5509788 A ZA 9407491 A	15-06-1998 29-10-1998 18-04-1995 04-02-1997 06-04-1995 06-04-1995 02-07-1998 15-10-1998 10-07-1996 16-08-1998 10-06-1997 22-07-1996 23-04-1996 15-05-1995
US 4910682	A	20-03-1990	US 4715786 A	29-12-1987
US 4108575	A	22-08-1978	DE 2535650 A1 FR 2321147 A1 GB 1519415 A IT 1060800 B JP 52022393 A	10-02-1977 11-03-1977 26-07-1978 30-09-1982 19-02-1977
US 4705457	A	10-11-1987	NONE	
US 5269660	A	14-12-1993	FR 2664024 A1 AT 101705 T CA 2065252 A1 DE 69101216 D1 DE 69101216 T2 EP 0489150 A1 WO 9200492 A1 IE 912323 A1 NO 920797 A	03-01-1992 15-03-1994 03-01-1992 24-03-1994 22-09-1994 10-06-1992 09-01-1992 15-01-1992 28-02-1992